is known, however, to have a motile stage or endospores. The intermediate position of this microorganism is clearer than its disposition in any present classification.

The middle lamellae.—To the botanist the fundamental contribution of these observations is that the denser material between plant cell walls is not a chemical (calcium pectate), as suggested by Mangin who discovered these bodies, but living microorganisms that may be grown in culture media outside the plant. Further, the old conception that the interior of plants is sterile is not tenable. The role which these microorganisms play in the physiology of the higher plants will have to be determined by future experiments, but the abundance of the filaments in enlarged roots (carrots, beets, turnips) and tubers (potato, sweetpotato, and Jerusalem artichoke) suggests the formation of some type of growth-stimulating substances. It may be pointed out that the invasion of the cork cambium of young potato tubers by a similar microorganism stimulates the cork cells to produce hypertrophied tissue known as common or corky scab.

ADDENDUM

The day following the receipt of the manuscript for transmittal to the editors of the JOURNAL, word was received of the fatal illness of the senior author of this paper. In the meantime it has come to my attention that G. B. Sanford recently published a paper in *Scientific Agriculture*, vol. 28, pp. 23–25, 1948, entitled *The occurrence of bacteria in normal potato plants and legumes.* In addition, I am informed that a manuscript by Tervet and Hollis along the same line has been accepted for publication and will shortly appear in *Phytopathology*. These and former papers seem to leave little doubt that healthy plant tissues may contain microorganisms. The frequency of their occurrence and their function still remain to be discovered. —NATHAN R. SMITH.

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ZOOLOGY.—Hesperochernes thomomysi, *a new species of chernetid pseudoscorpion from California.*[1] C. CLAYTON HOFF, University of New Mexico. (Communicated by EDWARD A. CHAPIN.)

Pseudoscorpions are common in the nests of burrowing rodents. The species found in rodent nests have received relatively little attention, however, perhaps as a result of difficulties encountered in making species determinations in the groups to which most of these forms belong. In the present paper, a new species of the genus *Hesperochernes* is described from the nest of *Thomomys monticola* from California, the description being based on material submitted by Dr. Edward A. Chapin, of the United States National Museum. The type specimens mounted on microscope slides are deposited in the National Museum. As a result of our very inadequate knowledge of chernetid

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[1] Received June 7, 1948.

pseudoscorpions, the inclusion of the generic description is considered advisable.

Suborder Monosphyronida Chamberlin, 1929
Family Chernetidae Menge, 1855
Genus **Hesperochernes** Chamberlin, 1924

Hesperochernes Chamberlin, Pan-Pacific Ent. **1**: 89–90. 1924; Beier, Das Tierreich **58**: 174. 1932; Hoff, Bull. Illinois Nat. Hist. Survey. (In press.)

Cephalothorax clearly longer than wide; carapace granular, with two transverse carapacal furrows. Tergites divided, granular. Palpi stout, femur with well-defined pedicle. Setae of body and palps usually lightly, but clearly clavate. Flagellum with four setae; setae *b* and *sb* of hand of chelicera thickened and denticulate. The sensory seta *ist* of the fixed chelal finger is distal to *est; st* of the movable chelal finger is found nearer to *t* than to *sb*. The tarsus of the fourth leg is without a true sensory seta, although a short toothed pseudotactile seta may be present.

Genotype: *H. laurae* Chamberlin, 1924 (through original designation).

Hesperochernes thomomysi, new species

Female.—The description of the female is based on two specimens, the holotype and a paratype. The measurements of various structures of the holotype are followed in parentheses by the corresponding measurements of the paratype whenever the two differ significantly. Body stout, light yellowish brown in color; palpi deeper brown, often golden brown to reddish brown, and moderately stout; body length 3.1 (2.7) mm. Carapace light yellowish brown to golden brown, transverse furrows well marked, posterior furrow nearer to the posterior carapacal margin than to the median furrow; posterior margin well rounded, lateral margins convex and passing without interruption into the anterior margin; carapace somewhat subtriangular in shape; dorsal surface of carapace virtually smooth except for very fine netlike markings, lateral surfaces moderately granulate; setae very numerous, well scattered, terminally denticulate, not clavate; eyes not distinguished; length of carapace 0.98 (0.92) mm, width 0.96 (0.83) mm; greatest width in the posterior half of the carapace. Abdomen oval in shape, very stout; tergal halves well separated by rugose and nonsclerotic areas; setae small, mostly nonclavate, terminally denticulate, similar to those of the carapace; each tergal half of tergite 1 with eight or nine setae, maximum number of setae on any tergal half is 10; tergite 11 not divided; surface of tergites marked much like the dorsal surface of the carapace. Ventral surface of abdomen with the sternal halves well separated medially; halves of sternite 4 with two setae in holotype, with three or four in paratype; each half of sternite 5 with seven to nine setae; maximum number of setae on any sternal half is 10; setae longer and more conspicuous than on the tergites; setae of sternites acuminate. Each anterior stigmatic plate with two or three acuminate setae; each posterior plate with one seta; pleural membranes with rugose and wavy parallel striations. Abdomen 2.1 (1.8) mm in length; width 1.73 (1.42) mm.

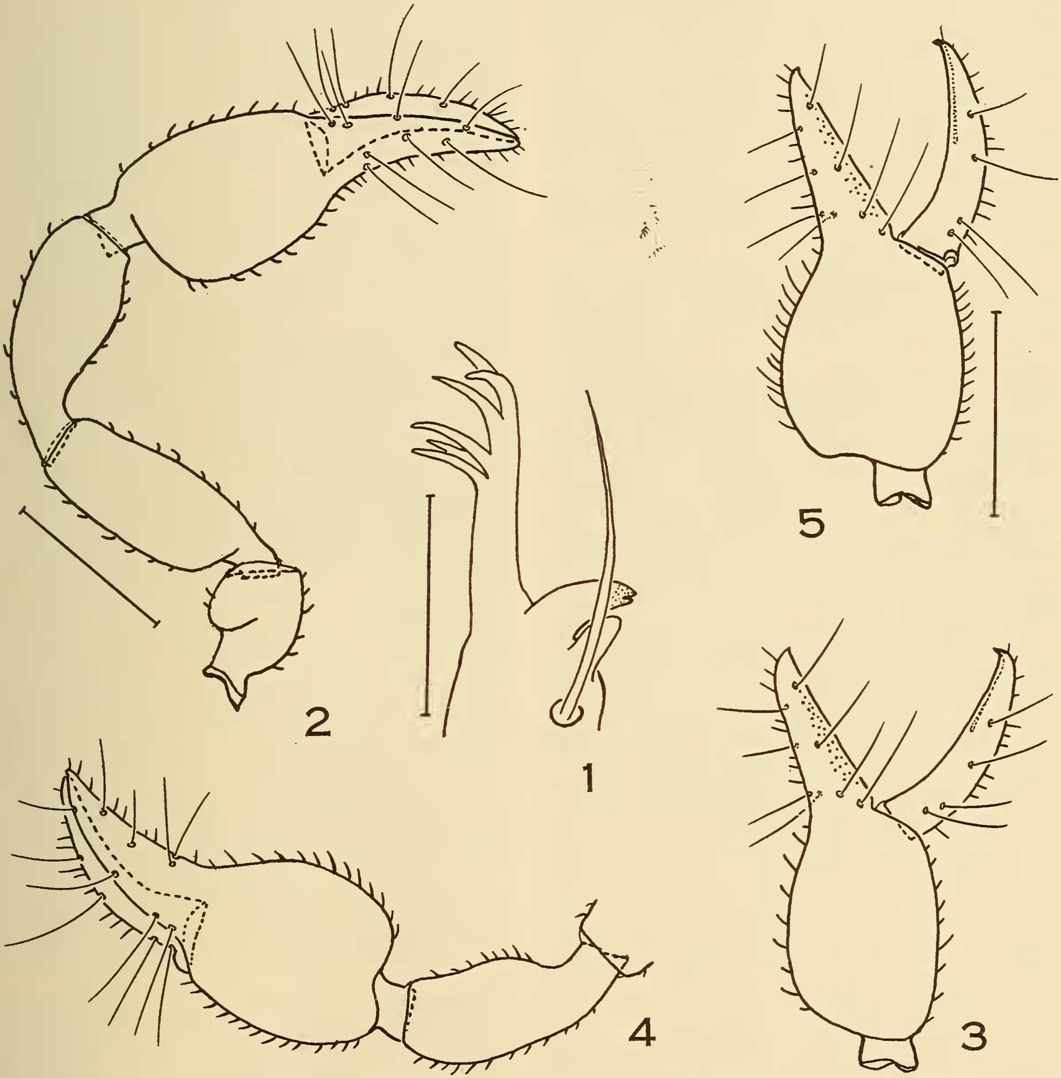
Chelicera: Yellow in color; moderately stout; 0.28 (0.27) mm long, base 0.17 mm wide; subbasal seta of base stout, widened, with numerous terminal and subterminal denticulations; basal seta more slender and with fewer denticulations, in some instances the denticulations are difficult to observe; internal and laminal setae very long and acuminate; surface of hand unsculptured except for a roughened area in the region of the insertion of the subbasal seta; flagellum with the largest seta distinctly bladelike, a little curved, and deeply serrate along one margin throughout almost the entire length of the blade; the two proximally placed setae subequal in length and each longer than half the length of the longest blade of the flagellum. Fixed cheliceral finger with well-developed lamina exterior, markedly convex near the center of the finger; apical tooth with three or four small and rounded denticles on the inner margin; inner finger margin with four or five denticles in the distal third of the margin, the distal two heavy and conical in shape, the proximal two or three more weakly developed and more retroconical; serrula interior with four distal plates free, others fused. Movable finger stout, little curved; 0.22 (0.23) mm long; serrula exterior of 17 to 19 ligulate plates, of which the proximal one is much longer than the others; galeal seta almost reaching the tip of the galea; galea with a stout base, antlerlike, with six somewhat curved branches confined to the distal half of the galea; apical tooth sclerotic and terminally bicuspid; subapical lobe just basal to the apical tooth and distal to the base of the galeal seta, somewhat smaller than the apical tooth and frequently blunt.

Palpus: Moderately stout; surface of podomeres virtually unmarked and almost nongranulate except the maxilla; maxilla with weakly granulate surface and with numerous, short and stout setae, many of which have a few terminal denticulations; setae of podomeres in general subclavate and fairly stout on the proximal podomeres, longer, more slender, and nonclavate on the distal podomeres, each seta with a few terminal and subterminal denticulations; investing setae of chelal fingers acuminate; color variable, deep golden brown in holotype to light yellowish brown in paratype. Maxilla 0.48 (0.43) mm long, 0.34 (0.31) mm wide. Trochanter somewhat club-shaped, pedicle stout, two protuberances present, 0.44 mm long, 0.26 (0.24) mm wide in strict dorsal view. Femur with pedicle about as long as wide and well set-off from the rest of the podomere; extensor margin very little convex in the center, more convex near the ends; flexor margin weakly S-shaped femur widest near the center; greatest over-all length 0.74 (0.73) mm, length along either the extensor or flexor margin 0.68 (0.66) mm; width 0.275 (0.26) mm. Tibia with stout pedicle; flexor margin somewhat evenly convex except towards the distal end and in the region of the pedicle; extensor margin markedly convex near the ends; length 0.67 (0.64) mm, width 0.28 (0.26) mm. Chela with hand stout and fingers fairly well separated from the hand; extensor margin of hand flatly convex, flexor margin more or less evenly and distinctly convex; hand somewhat bulging in the flexor-basal angle and the pedicle far displaced towards the extensor margin; fingers gently curved and narrowed regularly and decisively from base to distal end; length of chela 1.14 (1.08)mm, width 0.43 (0.40) mm; length of hand 0.57 (0.55) mm; length of movable finger 0.57 (0.55) mm. From the side, the chela has a subrectangular hand, with the pedicle almost at the ventral-basal corner; ventral margin weakly and evenly convex; dorsal margin more convex and, with the basal margin, forming a well-rounded angle; depth of hand 0.43 (0.41) mm; fixed finger nearly straight, more or less cone-shaped in outline and broadly joined to the hand; external aspect of fixed finger near the inner margin is conspicuously granulate; the movable finger less stout but well curved, especially in the proximal third of the finger. Each finger with between 40 and 45 marginal teeth, all with cusps and contiguous; the marginal teeth of the distal end of the row more acute and with better developed cusps than those at the proximal end of the row; fixed finger with four or five internal and four or five external accessory teeth, all confined to the distal one-half of the finger; movable finger with two internal and three to five external accessory teeth, all found in less than the distal half of the finger; nodus ramosus of movable finger somewhat nearer tactile seta *t* than *st* in the holotype and nearer *st* than *t* in the paratype. Tactile setae as usual in the genus; *st* varying from a little (holotype) to considerably (paratype) closer to *t* than to *sb*; other tactile setae as shown in the figure.

Legs: Moderately stout; yellowish brown, often very light in color; surface of podomeres nongranular; setae except on tarsi fairly heavy, subclavate, with numerous subterminal and terminal denticulations; setae of tarsi like those of other podomeres basally and on the extensor surface, but distally and on the flexor surface relatively stout and acuminate; terminal tarsal claws well curved and slender. First leg with trochanter subquadrate, 0.185 mm long, 0.147 mm deep; pars basalis distally deepened, flexor margin more or less evenly rounded, length measured along the flexor margin 0.245 (0.24) mm, depth 0.175 (0.165) mm; pars tibialis with both flexor and extensor margins evenly convex, deepest near the center, length measured along the extensor margin 0.37 (0.36) mm, depth 0.147 (0.135) mm; tibia with extensor margin weakly S-shaped, flexor margin somewhat evenly convex, 0.405 (0.39) mm long, 0.118 (0.105) mm deep; tarsus subcylindrical, flexor margin a little convex, length 0.41 (0.40) mm, depth 0.083 (0.076) mm. Fourth leg with trochanter having a very weakly but evenly convex flexor margin, extensor margin much more convex, especially in the central portion, entire podomore somewhat quadrate in outline, length 0.34 mm, depth 0.195 (0.178) mm: pars basalis subtriangular, flexor margin weakly convex to almost straight, length measured along the flexor margin 0.27 (0.25) mm, depth 0.18 (0.17) mm; pars tibialis with flexor margin nearly straight, extensor margin evenly or flatly convex, deepest near the center, length measured along the extensor margin 0.52 (0.50) mm, depth 0.20 (0.18) mm; length of entire femur 0.73 (0.70) mm; tibia shaped much as in the first leg but much more slender, very weakly S-shaped or extensor margin virtually straight except near the proximal end, length 0.60 (0.61) mm, depth 0.125 (0.12) mm; tarsus subcylindrical but the flexor margin somewhat convex, podomere deepest near the center, length 0.47 (0.46) mm, depth 0.095 (0.09) mm.

External genitalia: Simple; anterior operculum with 14 closely clustered setae, posterior to which is found a group of 13 (11) well-spaced and well-separated setae; posterior operculum with a single row of eight (13) setae.

Male.—The collection contains four males, one of which is designated the allotype. The



Hesperochernes thomomysi, new species

Fig. 1.—Tip of movable finger of chelicera, female holotype; scale 0.05 mm. Fig. 2.—Dorsal view of palpus, female holotype; scale 0.5 mm. Fig. 3.—Lateral view of chelal hand, female holotype; scale as in Fig. 2; marginal and accessory teeth omitted. Fig. 4.—Dorsal view of tibia and chela of palpus, male allotype; scale as in Fig. 5. Fig. 5.—Lateral view of chelal hand, male allotype; scale 0.5 mm; marginal and accessory teeth omitted.

measurements given are the limits of range of the four specimens. In general, male similar to female but smaller; body length 2.0–2.4 mm; carapace 0.76–0.82 mm long, 0.62–0.73 mm wide. Abdomen usually with seven setae on each half of tergite 1, other tergal halves usually with eight or nine setae; each half of sternite 4 with three to four acuminate setae, each half of sternite 5 with seven to ten setae, maximum number of setae on any sternal half is ten, in some specimens only eight or nine; anterior stigmatic plate with three setae, posterior plate with one seta; length of abdomen 1.19–1.60 mm.

Chelicera: Much as in the female; serrula exterior with 17 to 19, but usually 18, ligulate plates; length of chelicera about 0.24 mm, width of base between 0.14 and 0.15 mm, length of movable cheliceral finger 0.18–0.195 mm.

Palpus: Variable but much like that of the female except podomeres a little smaller, tibia and chela distinctly stouter and of different shape, and a tendency for the flexor surfaces of the femur and tibia to be very weakly granulate. Some specimens with palpi dark reddish-brown in color. Maxilla 0.38–0.43 mm long, 0.27–0.28 mm wide. Trochanter 0.37–0.39 mm long, 0.195–0.23 mm wide. Femur with flexor margin more S-shaped and extensor margin more irregular and more flattened near the center than in the female; greatest length 0.57–0.66 mm, length measured along either margin 0.53–0.58 mm, width 0.23–0.25 mm, greatest length between 2.5 and 2.8 times the width, length along either margin 2.25 to 2.5 times the width. Tibia with slight to well-marked concavity just proximal to the distal end of the flexor margin, length 0.53–0.59 mm, width 0.24–0.26 mm, length 2.2 to 2.3 times the width. Chela very stout; extensor margin evenly and markedly convex, the flexor margin more rounded and convex, giving the hand a subspherical appearance when viewed from the dorsad; flexor-basal corner distinctly swollen; fingers from the dorsad as in the female; length of chela without pedicle 0.97–1.07 mm, width 0.415–0.52 mm, length 2.05 to 2.35 times the width; length of hand 0.50–0.53 mm, length of movable finger 0.53–0.62 mm. From the side, the chela of the male relatively deeper than in the female, depth 0.44–0.55 mm; ventral margin evenly but not greatly convex, dorsal margin bulging and rounded, especially in the area where it merges with the basal margin; marginal teeth about 40, varying from 35 to 45; accessory teeth extremely variable, each row with three (in one instance two) to as many as eight accessory teeth; on movable finger tactile seta *st* is nearer to *t* than to *sb* and the nodus ramosus in most individuals is conspicuously nearer to *st* than to *t*; tactile setae somewhat variable in the fixed finger but in general as shown in the figure.

Legs: Conspicuously smaller than in the female, otherwise very similar; some podomeres possibly a little more slender but limited material precludes definite statement regarding the condition in all podomeres. First leg with trochanter 0.14–0.155 mm long, 0.12–0.135 mm deep, length 1.15 to 1.25 times the depth; pars basalis 0.185–0.2 mm long, 0.135–0.15 mm deep, length 1.3 to 1.4 times the depth; pars tibialis 0.29–0.31 mm long, 0.12–0.13 mm deep; length 2.35 to 2.5 times the depth; tibia 0.31–0.35 mm long, 0.09–0.105 mm deep, length 3.3 to 3.4 times the depth; tarsus 0.32–0.345 mm long, 0.07–0.075 mm deep, length 4.55 to 4.75 times the depth. Fourth leg with trochanter 0.25–0.275 mm long, 0.135–0.155 mm deep, length 1.7 to 1.85 times the depth; pars basalis 0.195–0.22 mm long, 0.135–0.155 mm deep, length 1.35 to 1.4 times the depth; pars tibialis 0.39–0.46 mm long, 0.155–0.175 mm deep, length 2.45 to 2.65 times the depth; entire femur 0.54–0.62 mm long, length 3.35 to 3.65 times the depth; tibia 0.45–0.55 mm long, 0.10–0.122 mm deep, length 4.4 to 4.7 times the depth; tarsus 0.39–0.41 mm long, 0.08–0.09 mm deep, length 4.55 to 5.0 times the depth.

External genitalia: 20 to 25 fine and acuminate setae on the anterior operculum anterior and lateral to the genital slit; the posterior operculum with four setae in a row immediately posterior to the genital slit and 16 to 25 setae, many in a single row but a few scattered, behind the four setae; chaetotaxy variable.

Tritonymph.—Measurements are given as the limits of variation of five individuals. Measurements of the legs are not included since these may be considered of little importance to the species description. Tritonymph much like the female but smaller and lighter in color; length of body 1.9–2.5 mm. Carapace possibly a little more granulate than in the female and the investing setae a little more clavate; length of carapace 0.67–0.76 mm, width 0.51–0.62 mm. Abdomen with each half of tergite 1 having five to seven setae, other tergal halves usually with six to eight setae; each half of sternite 4 with two to five setae, of sternite 5 with six or seven setae; maximum number of setae on any sternal half is seven; each anterior stigmatic plate with one or two setae; posterior stigmatic plate with one seta; abdomen otherwise much as in the female; length 1.35–1.8 mm, width 0.9–1.4 mm.

Chelicera: General structure like that of the female. Tactile seta *b* noticeably smaller than *sb*, less stout and with very few denticulations or appearing acuminate perhaps as a result of being in a position unfavorable for study; inner margin of fixed finger sometimes with three or six teeth but usually four or five; galea relatively stouter than in the female, four or five antlerlike branches in the distal half; 14 to 16, usually 15, plates in the serrula exterior; length of movable cheliceral finger 0.17–0.18 mm.

Palpus: In general like that of the female but on the average lighter in color; podomeres smaller in size; tibia and femur stouter; setae much less numerous but of the same type as in the adult; surface of all podomeres, especially the flexor surfaces, moderately granular; pedicle of all podomeres relatively stouter than in the adult; pedicle of chela nearer the center of the base of the hand than in the adult; trochanter 0.28–0.32 mm long, width 0.175–0.20 mm, length 1.6 to 1.75 times the width; femur 0.48–0.54 mm long, 0.195–0.21 mm wide, length 2.25 to 2.55 times the width; tibia 0.40–0.49 mm long, 0.20–0.23 mm wide, length 2.0 to 2.25 times the width; chela 0.72–0.85 mm long, 0.27–0.32 mm wide, length 2.6 to 2.7 times the width; length of hand 0.34–0.43 mm, depth of hand 0.31–0.34 mm; movable chelal finger 0.39–0.45 mm in length. From the side, the chelal hand is much more like that of the female than the male; marginal teeth of fingers nsually between 30 and 35 in a number; accessory teeth variable, one to four in each row. Movable chelal finger with nodus ramosus just proximal to tactile seta *t*; one tactile seta absent; the center one of the three tactile setae may be closer to the basal (*b* or *sb*?) or to the distal seta *t*. Fixed finger with *ist* missing; other tactile setae much as in the adult except *it* is relatively farther removed from *et*.

Legs: Lighter in color, with fewer setae, smaller, and stouter than in the adult, but otherwise very similar. Tarsus of first and fourth legs somewhat fusiform, narrowed distally.

Type Locality.—Fresno County, Calif. The female holotype, one female paratype, the male allotype, three male paratypes, and five tritonymph paratypes were taken from a nest of *Thomomys monticola* on January 27, 1947, at Huntington Lake, elevation 7,000 feet, by I. G. Ingles.

Remarks.—Our new species, *H. thomomysi*, may be separated from other species of the genus by the shape and size of the palpal podomeres as well as other characteristics. The species seems somewhat closely related to *H. sanborni* (Hagen, 1869) from the New England states and to *H. pallipes* (Banks, 1893) from California. No difficulty is experienced in separating this form from the two closely related species on the basis of characteristics given in the above description. From the type of the genus, *H. laurae* Chamberlin, 1924, our form is easily separated by the smaller and stouter palpal podomeres. Only two species, *H. laurae* and *H. pallipes*, have been reported previously from California.